

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An apparatus comprising:
one or more optical fibers or other waveguides for receiving light; and
one or more modeled tap structures formed in the one or more optical fibers or waveguides configured so that, when the light travels through said one or more optical fibers or waveguides, the one or more modeled tap structures direct the light in predetermined directions so as to create a desired illumination pattern by scattering, diffraction, reflection and/or refraction of portions of the light through the one or more modeled tap structures formed by using pattern parameters determined by modeling the desired illumination pattern.
2. (Previously Presented) The apparatus according to claim 1, wherein the illumination pattern is generally spherical in shape.
3. (Previously Presented) The apparatus according to claim 1, wherein the illumination pattern is generally in the shape of an arc.

4. (Previously Presented) The apparatus according to claim 1, wherein the illumination pattern is generally cylindrical in shape.

5. (Previously Presented) The apparatus according to claim 1, wherein the illumination pattern is generally conical in shape.

6. (Original) The apparatus according to claim 1, further comprising:
one or more reflective surfaces disposed within the one or more optical fibers or waveguides, wherein the one or more reflective surfaces reflects the light so that the reflected beam of light travels in a direction substantially opposite to the original direction of travel of the light.

7. (Previously Presented) The apparatus according to claim 1, wherein the one or more modeled tap structures have an asymmetrical geometry.

8. (Currently Amended) The apparatus according to claim 1, wherein the one or more modeled tap structures extend radially in an arc or completely around the one or more optical fibers or waveguides.

9. (Previously Presented) The apparatus according to claim 1, wherein the one or more modeled tap structures each comprise a continuous circular tap structure.

10. (Previously Presented) The apparatus according to claim 1, wherein the one or more modeled tap structures are arranged in an array extending along a length of the one or more optical fibers or waveguides.

11. (Previously Presented) The apparatus according to claim 1, wherein the one or more modeled tap structures each have a length extending in a longitudinal direction of the respective optical fiber or waveguide larger than a width extending in a radial direction of the respective optical fiber or waveguide.

12. (Original) The apparatus according to claim 1, further comprising:
one or more light sources that provide the light to the one or more optical fibers or waveguides.

13. (Previously Presented) The apparatus according to claim 12, wherein the one or more light sources comprise one or more selectively controllable light sources.

14. (Currently Amended) The apparatus according to claim 13, wherein the one or more selectively controllable light sources have varying illumination powers.

15. (Original) The apparatus according to claim 12, wherein the one or more light sources provide at least partially coherent light to the one or more optical fibers or waveguides.

16. (Original) The apparatus according to claim 12, wherein the one or more light sources provide incoherent light to the one or more optical fibers or waveguides.

17. (Original) The apparatus according to claim 12, wherein the one or more light sources provide visible light to the one or more optical fibers or waveguides.

18. (Original) The apparatus according to claim 12, wherein the one or more light sources provide UV light to the one or more optical fibers or waveguides.

19. (Original) The apparatus according to claim 12, wherein the one or more light sources provide infrared light to the one or more optical fibers or waveguides.

20. (Original) The apparatus according to claim 12, wherein the one or more light sources comprise one or more lasers.

21. (Previously Presented) The apparatus according to claim 20, wherein the one or more light sources comprise one or more semiconductor laser diodes.

22. (Original) The apparatus according to claim 20, wherein the one or more light sources comprise one or more high power laser diodes.

23. (Original) The apparatus according to claim 20, wherein the one or more light sources comprise one or more light emitting diodes.

24. (Currently Amended) An apparatus comprising:
one or more optical fibers or waveguides for receiving light; and
a continuous modeled tap structure formed in the one or more optical fibers or waveguides configured so that, when the light travels through said one or more optical fibers or waveguides, the continuous modeled tap structure directs the light in predetermined directions so as to create a desired illumination pattern by scattering, diffraction, reflection and/or refraction of portions of the light through the continuous tap structure formed by using pattern parameters determined by modeling the desired illumination pattern.

25. (Currently Amended) An apparatus comprising:
one or more optical fibers or waveguides for receiving light; and

one or more modeled tap structures formed in the one or more optical fibers or waveguides configured so that, when the light travels through said one or more optical fibers or waveguides, the one or more modeled tap structures direct the light in predetermined directions so as to optimize an amount of the light output through the one or more modeled tap structures, wherein the one or more modeled tap structures are formed by using pattern parameters determined by modeling an illumination pattern configured for optimized light output.

26. (Original) The apparatus according to claim 25, wherein greater than approximately 90% of the light is output through the one or more tap structures.

27. (Currently Amended) An apparatus comprising:
one or more photon channeling structures for receiving photons; and
one or more modeled tap structures formed in the one or more photon channeling structures configured so that, when the photons travels through said photon channeling structures, the one or more modeled tap structures direct the light in predetermined directions so as to create a desired pattern by scattering, diffraction, reflection and/or refraction of portions of the photons through the one or more modeled tap structures formed by using pattern parameters determined by modeling the desired pattern.

28. (Original) The apparatus accordingly to claim 27, wherein the photons comprise light.

29. (Original) The apparatus accordingly to claim 27, wherein the photons comprise incoherent radiation.

Claims 30-35. (Canceled)

36. (Currently Amended) The apparatus according to claim 1, wherein the one or more modeled tap structures comprise a plurality of modeled tap structures ~~arranged in~~ of a specific shape, depth, and spacing configured by the modeling process to create a desired illumination pattern based on a particular application.

37. (Currently Amended) The apparatus according to claim 25, wherein the one or more modeled tap structures comprise a plurality of modeled tap structures ~~arranged in~~ of a specific shape, depth, and spacing configured by the modeling process to create a desired illumination pattern based on a particular application.

38. (Previously Presented) The apparatus according to claim 1, wherein the tap structures are modeled using an iterative process.

39. (Previously Presented) The apparatus according to claim 1, wherein the tap structures are modeled using a theoretical modeling process.

40. (Previously Presented) The apparatus according to claim 24, wherein the tap structure is modeled using an iterative process.

41. (Previously Presented) The apparatus according to claim 24, wherein the tap structure is modeled using a theoretical modeling process.

42. (Previously Presented) The apparatus according to claim 25, wherein the tap structures are modeled using an iterative process.

43. (Previously Presented) The apparatus according to claim 25, wherein the tap structures are modeled using a theoretical modeling process.

44. (Previously Presented) The apparatus according to claim 27, wherein the tap structures are modeled using an iterative process.

45. (Previously Presented) The apparatus according to claim 27, wherein the tap structures are modeled using a theoretical modeling process.